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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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FISH & RICHARDSON PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			MEHRA, INDER P	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/632,867	Applicant(s) YONGE ET AL.	
	Examiner Inder P. Mehra	Art Unit 2666	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 and 17-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 17-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/9/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/9/05 has been entered.
2. Based on this amendment dated: 9/9/05, claims 1-15 and 17-20 are pending. Independent claims 1, 9-10 and 15 have been amended.

Claim Rejections - 35 USC # 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action'.

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-9, 15, 17, 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marchetto et al. (US 5,914,959) in view of Kaiser et al. (US 6,188,717) and Jalali (US 6,778,507), further in view of **Foley** (US Patent Application No. 2001/0012319).

Regarding claims 1, 9, 15 and 20, Marchetto discloses adapting a connection between a transmitter and a receiver to a data rate for each carrier of the channel based on characteristics of each carrier of the channel for the connection (col. 1, line 57 - col. 2, line 28).

Marchetto fails to expressly disclose transmitting data across a plurality of different connections between any of a plurality of transmitters and any of a plurality of receivers, and that the data rate established for at least some carriers differs from the data rate established for at least some other carriers.

Kaiser discloses a multi-carrier wireless communication system that permits variable data rates for each individual subscriber (col. 5, line 66 - col. 6, line 10). Kaiser discloses the need to transmit audio, video, text data, etc. as a motivation for providing variable data rate communication among distributed subscribers.

Jalali discloses a system that includes a plurality of different connections between a plurality of receivers and plurality of transmitters (see Figure 1).

Foley discloses more explicitly the following limitation, as pointed out by applicant:

“adapting connections between particular pairs of transmitter and receiver to establish a data rate for each carrier of the channel based on characteristics of each carrier of the channel for the connection between a particular pair of transmitter and receiver, wherein the data rate established for at least some carriers for at least one pair differs from the data rate established for the same carriers for at least one other pair”, **(refer to “HAN signals (the modulated information signals) are modified in accordance with the stored processing parameters for the associated receiver/transmitter pair. Keeping local copies of processing parameters at each network client avoids retraining each time a receiver is to receive data from a new transmitter and allows rapid switching of receivers and transmitters”**, refer to paragraph 0076).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to adapt some connections to operate at a different data rate than others. Also, it would have been obvious to include connections between a plurality of receivers and a plurality of transmitters through the use of an array of antennas at a base station and multiple mobile stations. One of ordinary skill in the art would have been motivated provide variable data rates to maintain efficient use of resources when different subscriber stations have different bandwidth requirements. One of ordinary skill in the would also have been motivated to include the plurality of connections between receivers and transmitters in order to reduce intra cell interference through the use of beamforming.

Regarding claim 2, Marchetto discloses a transmitter sending a pilot symbol in a frame to a receiver, and at the receiver determining from the frame the characteristics of the channel for the connection and generating channel information. Marchetto also discloses sending the channel information to the transmitter for use in transmissions to the receiver (col. 1, line 65 - col. 2, line 24).

Regarding claim 3, Marchetto discloses optimizing delivery of subsequent communications (col. 2, lines 20-24).

Regarding claim 4, Marchetto discloses repeating the adapting after a predetermined timeout (col. 6, lines 28-39).

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Regarding claim 5, Marchetto discloses adapting the transmission rate in between transmissions (col. 5, 21-24), which represents a frame transmission recovery.

Regarding claim 6, Marchetto discloses repeating the adapting in response to an indication from the receiver (col. 5, 21-27).

Regarding claim 7, Marchetto discloses adapting due to a change in the number of bit errors occurring in transmissions to the receiver (col. 2, lines 11-16)

Regarding claim 8, Marchetto disclose that the data rate may be the maximum data rate (col. 5, lines 13-21).

Regarding claims 17 and 18, Mrchetto discloses a transmitter sending a pilot symbol in a frame to a receiver, and at the receiver determining from the frame the characteristics of the channel for the connection and generating channel information. Marchetto also discloses sending the channel information to the transmitter for use in transmissions to the receiver (col. 1, line 65 - col. 2, line 24).

5. Claims 10-12 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marchetto et al. (US 5,914,959) in view of Myers et al. (US 6,216,244) and Jalali (US 6,778,507).

Regarding claim 10, Marchetto discloses a receiver sending an indication of the data rate,

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or signal constellation, to a transmitter so that the data will be transmitted from the transmitter to the receiver at a rate that insures reception (col. 5, lines 42-47). In this embodiment, the signal constellation represents the channel map of the present invention, and the indication of that signal constellation represents the channel map index of the present invention.

Marchetto also discloses sending constellation information, representing the channel map index, in a transmission from the transmitter to the receiver (col. 6, lines 17-28).

Marchetto fails to expressly disclose transmitting data across a plurality of different connections between any of a plurality of transmitters and any of a plurality of receivers, and that the encoding and modulating for at least some carriers differs from that used for at least some other carriers.

Myers discloses using different encoding and modulation for different carriers (col. 3, lines 49-61, see also Figure 4). Jalali discloses a system that includes a plurality of different connections between a plurality of receivers as well as a plurality of transmitters (see Figure 1).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use different encoding and modulation for different carriers in the invention of Marchetto. Also, it would have been obvious to include connections between a plurality of receivers and a plurality of transmitters through the use of an array of antennas at a base station and multiple mobile stations. One of ordinary skill in the art would have been motivated provide different encoding and modulation in order to equalize gain differences based on distances of mobile units to a base station. One of ordinary skill in the would also have been motivated to include the plurality of connections between receivers and transmitters in order to reduce intra cell interference through the use of beam forming.

Regarding claim 11, Marchetto discloses a system data frame (col. 3, lines 10-21), which represents the frame control field of the present invention.

Regarding claim 12, Marchetto discloses using a channel map index, but fails to expressly disclose using the same channel map index at more than one receiver.

Myers discloses areas within a cell wherein the encoding and modulation rate is the same (see Figure 2).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the same channel map index for more than one connection. One of ordinary skill in the art would have been motivated to do this in order to provide two different connections within a particular sector of a cell with the appropriate encoding and modulation information for that Sector.

Regarding claim 19, Marchetto discloses a transmitter sending a pilot symbol in a frame to a receiver, and at the receiver determining from the frame the characteristics of the channel for the connection and generating channel information. Marchetto also discloses sending the channel information to the transmitter for use in transmissions to the receiver (col. 1, line 65 - col. 2, line 24).

6. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marchetto et al. (US 5,914,959) in view of Myers et al. (US 6,216,244) and Jalali (US 6,778,507)

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as applied to claims 10-12 above, and further in view of Petry et al. (US 6,538,985).

Regarding claim 13, Marchetto in view of Myers and Jalali fails to expressly disclose that the channel is a power line.

Petry discloses an OFDM protocol that is compatible with Ethernet, which is used as a wired technology (col. 4, lines 1-6). Ethernet represents a technology wherein the channel is a power line, as in the present invention. At the time the invention was made,

It would have been obvious to a person of ordinary skill in the art to use a power line as a channel. One of ordinary skill in the art would have been motivated to do this to support the system of Marchetto in view of Myers and Jalali in a variety of types of communication systems.

Regarding claim 14, Marchetto in view of Myers and Jalali fails to expressly disclose using OFDM.

Petry discloses a MAC protocol for a local area network using orthogonal frequency division multiplexing (OFDM) (col. 2, lines 54-56).

As is well known in the art, multiplexing techniques are used to allow multiple users to share a communication channel. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use OFDM in the system provided by Marchetto in view of Myers and Jalali. One of ordinary skill in the art would have been motivated to use OFDM in order to multiplex a number of receivers onto a channel for communication with a transmitter.

Response to Arguments

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7. Applicant's arguments with respect to claim 1-15 and 17-20 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues, None of the examiner's three references (Marchetto, Kaiser, or Jalali) teach such a network, in which there are a plurality of transmitters and a plurality of receivers and data can be transmitted across a plurality of different pairs of the transmitters and receivers. Marchetto has one transmitter (pager base station) communicating with multiple receivers (mobile paging units). Kaiser and Jalali are the same - one base station communicating with multiple subscriber stations. Jalali includes a figure (Fig. 1) showing a plurality of base stations and a plurality of subscribers stations (cell phones), but each subscriber stations only communicates with one of the base stations at any given time, and the subscriber stations do not communicate with each other. Thus, there are not a "plurality of different connections between any of a plurality of transmitters and any of a plurality of receivers."

2. "using a plurality of carriers"

The invention calls for a transmission between any pair of transmitter and receiver to be made "using a plurality of carriers". This is taught by the examiner's new references, Kaiser and Jalali, but not by his principal reference, Marchetto, which uses a single carrier.

3. adapting transmissions differently for different pairs of transmitter and receiver

The invention calls for channel adaptation of the multi-carrier transmission to differ for different pairs of transmitter and receiver. Claim 9 expresses this as follows:

adapting the manner in which carriers are used between particular pairs of transmitter and receiver connected to a channel based on characteristics of the channel, wherein the manner in which at least some carriers are used is different for at least some pairs from the manner in which the same carriers are used for at least some other pairs

This is perhaps the most striking difference between the invention and the

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examiner's references.

There is not the slightest suggestion or hint of anything like this in any of the examiner three references.

Adaptation is, of course, a well known technique. As the background of the application explains, it is used in multi-carrier communication, e.g., in point-to-point DSL communications.

What is different in the invention is that the adaptation is done differently for different pairs of transmitter and receiver. The same transmitter may use different adaptation depending on which receiver it is transmitting to.

Adaptation results in differences in the manner in which carriers are used between particular pairs of transmitter and receiver". Thus, for example, the same carrier might have one data rate (or one type of modulation, etc.) for one connection pair, and a different data rate (or a zero data rate, or a different type of modulation, etc.) for another connection pair. Thus, as the claim requires, the manner in which at least some carriers are used is different for at least some pairs from the manner in which the same carriers are used for at least some other pairs".

None of the examiner's references comes even remotely close to suggesting this feature of the invention. Marchetto teaches channel adaptation, but for a single carrier, and for transmission between the same transmitter and receiver.

Kaiser uses different data rates between the base station and the multiple subscriber stations, but the difference in data rate is not for adaptation to the channel, but to accommodate different data types being transmitted to/from a subscriber station (e.g., voice versus computer data). This is what is taught at the lines referred to by the examiner (col. 54, line

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66 - col. 6, line 10). Furthermore, the different data rates are the overall data rates of the connection, and not different data rates assigned to different carriers. Jalali also appears silent on channel adaptation.

The other three independent claims (1, 10, and 15) are similar to claim 9, but are somewhat more specific about how adaptation varies the manner in which the carriers are used for transmission. In claims 1 and 15, changes are made in a carrier's data rate. In claim 10, changes are made to a channel map that provides for the encoding and modulating for at least some carriers for at least one pair to be different from that used for the same carriers for at least one other pair"

In response, it is stated that, Foley (US Patent application No. 2001/0012319) discloses **"adapting connections between particular pairs of transmitter and receiver to establish a data rate for each carrier of the channel based on characteristics of each carrier of the channel for the connection between a particular pair of transmitter and receiver, wherein the data rate established for at least some carriers for at least one pair differs from the data rate established for the same carriers for at least one other pair",** (refer to **"HAN signals (the modulated information signals) are modified in accordance with the stored processing parameters for the associated receiver/transmitter pair.** Keeping local copies of processing parameters at each network client avoids retraining each time a receiver is to receive data from a new transmitter and allows rapid switching of receivers and transmitters", refer to paragraph 0076).

In response, it is further, stated that Jalali discloses "In an alternative embodiment, base stations coordinate the scheduling of transmit beams to minimize interference to

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subscriber stations in neighboring cells and to maximize throughput to each subscriber station in the network", refer to col. 7 lines 48-52.

In light of above explanation, arguments by applicant are not persuasive.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Inder P. Mehra whose telephone number is 571-272-3170. The examiner can normally be reached on Monday through Friday from 8AM to 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on 571-272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Inder Pal Mehra

Inder P Mehra
Examiner
Art Unit 2666

11/28/05



DANGLTON
PRIMARY EXAMINER